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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/630,262

07/30/2003

Xueying Huang

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PATENT RECORDS CENTER

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EXAMINER

SMITH, CAROLYN L

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/630,262	Applicant(s) HUANG ET AL.	
	Examiner Carolyn L. Smith	Art Unit 1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 October 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 and 13-34 is/are pending in the application.
- 4a) Of the above claim(s) 16-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 13-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's remarks, filed 10/1/07, are acknowledged. Claims 16-34 remain withdrawn as being drawn to non-elected subject matter.

Applicant's arguments, filed 10/1/07, have been fully considered but they are not deemed to be persuasive. Rejections and/or objections not reiterated from the previous office actions are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set presently being applied to the instant application.

Claims 1-11 and 13-15 are herein under examination.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-11 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of RAGUSE et al. (WO 01/25316), KRESSE et al. (IDS ref: US 6,048,515), EWALT et al. (IDS ref: US 5,922,537), EDWARDS et al. (US 2002/0120405, filed 9/27/2000), TEMPLETON et al. (Langmuir (1999) vol. 15, lines 66-76), and CHOO et al. (WO 2001/53478).

This rejection is maintained and reiterated for reasons of record.

RAGUSE teaches a film comprising cross-linked nanoparticles, wherein the cross-linkers may be proteins (p. 25, lines 11-14 and page 6, third paragraph). His nanoparticles may comprise gold or iron, a variety of metal oxides, and may be semiconductors (p. 24, lines 28-35 and p. 25, lines 1-4). RAGUSE also teaches that his linkers may have at least two functional groups (p. 25, lines 21-29). RAGUSE does not specifically teach that his linking protein comprises a member of the pair of glutathione-S-transferase/glutathione or a zinc-finger binding protein. RAGUSE does teach that his nanoparticles may be coated (see e.g. p. 11, lines 4-6 and 10-12), but does not teach either tiopronen or ethylene glycol coatings.

KRESSE teaches iron oxide nanoparticles coated with low molecular weight compounds, including polyethylene glycol, which may be used to stabilize the nanoparticle and enhance binding of bifunctional "targeting" compounds (col. 12, lines 17-30, col. 13, lines 14-25, and col. 15, lines 3-14).

EWART teaches nanoparticles comprising iron oxide cores (col. 9, lines 35-47) and a bifunctional linker wherein a recognition molecule may be a "zinc-finger" protein (col. 7, lines 39-67 and col. 8, lines 62-68).

EDWARDS teaches use of GST/glutathione tags for selectively anchoring proteins to a solid support, specifically to a semiconductor measuring device (para 38).

TEMPLETON teaches tiopronin monolayers surrounding metallic nanoparticles, wherein tiopronin stabilizes and protects the core of the monolayer (abstract).

CHOO teaches that a zinc finger protein shown in Example 1 (page 9) binds to a sequence which is 100% identical to instant SEQ ID NO: 1, and teaches that his protein is particularly useful in biotechnology (abstract).

It would have been obvious to one of ordinary skill in the art at the time of invention to have coated the nanoparticles of RAGUSE with the low molecular weight (i.e. short chain) ethylene glycol of KRESSE and the tiopronin of TEMPLETON where the motivation would have been to stabilize the nanoparticle and enhance binding of bifunctional linking agents, as taught by both KRESSE and TEMPLETON. One skilled in the art would reasonably have expected success in coating the nanoparticle of RAGUSE with the ethylene glycol and tiopronin of KRESSE and TEMPLETON because all teach coating metal cores to create nanoparticles. It would also have been obvious to one of ordinary skill in the art at the time of invention to have used the GST tag/glutathione pair of EDWARDS as the protein linker of RAGUSE where the motivation would have been to use a selective anchor for attaching the bifunctional reagent to a solid nanoparticle semiconductor, as taught by EDWARDS. It also would have been obvious to have used a zinc finger protein, specifically the sequence of CHOO where the motivation would have been to use a protein which is particularly useful in biotechnology, as taught by CHOO, and which is known to be a recognition/affinity molecule for use with nanoparticles, as taught by EWART. It would also have been obvious to have used iron oxide as the core of the nanoparticle of RAGUSE, TEMPLETON, KRESE, EDWARDS and CHOO where the motivation would have been to provide a specific functionality, as taught by EDWARDS.

Applicant summarizes the Raguse reference. Applicant argues that Raguse claims, but does not exemplify the use of proteins as cross-linkers for nanoparticles. This statement is found unpersuasive as the claims are the Raguse invention and this limitation was stated in the summary of the invention (page 6, third paragraph). Applicant argues that the Raguse nanoparticles are not coated even though they are coated with sodium citrate and octylammonium bromide which do not act as coating components or shielding components. This statement is found unpersuasive as "coating components" and "shielding components" have been broadly and reasonably interpreted to be any component that coats or shields. It is noted that Templeton describes tiopronin monolayers surrounding metallic nanoparticles, wherein tiopronin stabilizes and protects the core of the monolayer (abstract). Applicant argues that the interactions of the Raguse nanoparticles are not the lock-key type of specific interaction found in the subject invention. This statement is found moot as the instant claims do not recite such an interaction. Applicant argue that nanoparticles of the instant invention resist nonspecific binding. This statement is found moot as the instant claims do not recite any limitation that precludes nonspecific binding. Applicant argues that Raguse does not teach whether there is a monolayer coating on the nanoparticles. This statement is found unpersuasive as this is a 35 USC 103 rejection such that Raguse does not need to teach every limitation. Templeton describes monolayer coating on the nanoparticles (abstract). Applicant summarizes Kresse and argues the linker is for a small molecules, but not a protein. This statement is found unpersuasive as Kresse need not describe every limitation in this 35 USC 103 rejection. Applicant summarizes Ewalt and argues that Ewart describes the zinc-finger protein in the

context of using DNA as the bifunctional linker. This statement is found unpersuasive as Ewart teaches nanoparticles comprising iron oxide cores (col. 9, lines 35-47) and a bifunctional linker wherein a recognition molecule may be a “zinc-finger” protein (col. 7, lines 39-67 and col. 8, lines 62-68) and Raguse describe bifunctional proteins. Applicant summarizes Edwards and argues that GST-GSH interaction is on a flat substrate surface. This statement is moot as the claims do not preclude the use of a flat substrate surface. Applicant argues that Templeton relates to water-soluble nanoparticles, not protein-based bifunctional linkers. This statement is found unpersuasive as Templeton need not recite every limitation in the 35 USC 103 rejection. Raguse describe bifunctional proteins. Applicant summarizes Choo and argues that Choo does not anticipate the use of Zinc-finger proteins in materials manipulation. This statement is found unpersuasive as the instant claims do not recite materials manipulation. Applicant argues that none of the references provide a motivation to combine references. This statement is found unpersuasive as motivational statements have been provided, and Applicants failed to provide any sound reasoning as to why these motivations would be considered improper. Applicant reiterates arguments about non-specific binding which have already been found unpersuasive since this limitation is not recited in the instant claims. All of Applicant’s arguments are deemed unpersuasive for the reasons given above.

Conclusion

No claim is allowed.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO Fax Center. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993) (See 37 CFR §1.6(d)). The Central Fax Center number for official correspondence is (571) 273-8300.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carolyn Smith, whose telephone number is (571) 272-0721. The examiner can normally be reached Monday through Thursday from 8 A.M. to 6:30 P.M.

Application/Control Number:
10/630,262
Art Unit: 1631

Page 8

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marjorie Moran, can be reached on (571) 272-0720.

January 15, 2008

/Carolyn Smith/
Primary Examiner
AU 1631